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CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society Of America

Vol. XIII JUNE, 1941 No. 6

FIG. 37
View of Ventura Epiphyllum Gardens

CACTUS AND SUCCULENT JOURNAL

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PRESIDENT'S MESSAGE

With this issue of the JOURNAL, the last word has been said and the last appeal has been made for attendance at the National Convention in St. Louis. I have done all that seems possible to impress on our members the vital importance of this convention and the lasting effect it will have on increasing the interest in xerophytic plants in the United States.

Mr. Cutak has spent many hours in the preparation of every type of entertainment and social activity. Mr. Bock has gathered material for an outstanding photographic salon. Mr. Kelly, ably assisted by the other dealers of Southern California, has prepared a wonderful commercial show.

If you have not read the *Saturday Evening Post's* issue for June 7th, do not read it unless you plan to attend the convention. The article "Mister Shaw's Garden" on pages 16, 17 and 45, with its color plates taken at the Missouri Botanical Garden, will surely arouse your interest in this most interesting of the country's horticultural institutions and it may influence you to make any necessary sacrifice to be there.

It's your convention, prepared for your enjoyment and education. Will you enjoy it with us? As a center insert of this issue you will find the official souvenir program.

In conclusion, I would call to your attention the following letters:

May 23, 1941.

W. Taylor Marshall, *President*
The Cactus and Succulent Society of America
Dear Mr. Marshall:

As Mayor of the City of St. Louis, I would like to personally urge you to attend the convention of the *Cactus and Succulent Society of America,* meeting in St. Louis, July 4-6.

I have been informed of the splendid business and entertainment program arranged for you and I know that your time here will be well spent.

Accept my personal assurance that you will be welcome to St. Louis and that we will do everything in our power to help make your visit a memorable one.

Combine business and pleasure by attending this convention in St. Louis.

Trusting I may have the pleasure of extending to you the courtesies of our people,

Cordially yours,

WILLIAM DEE BECKER, *Mayor.*

FIG. 38. Charlie and Frank Sieloff, co-owners of the Seiloff Floral Company, in one of their cactus growing houses. The Saturday luncheon will be held at this interesting nursery, which is about 10 miles from St. Louis.

The Honorable WILLIAM DEE BECKER
Mayor of the City of Saint Louis
Saint Louis, Mo.

Dear Mr. Mayor:

The Cactus and Succulent Society of America does appreciate the honor you have done us in personally inviting each of our members to attend our convention in your city and for the welcome you have extended.

Our appreciation can best be shown by the size of the attendance on this occasion and I feel sure that our membership will make every effort to have in St. Louis as large an attendance as is possible.

I heartily join you in urging our members to participate in the cultural and social activities of this convention.

Very sincerely yours,

W. TAYLOR MARSHALL, *President.*

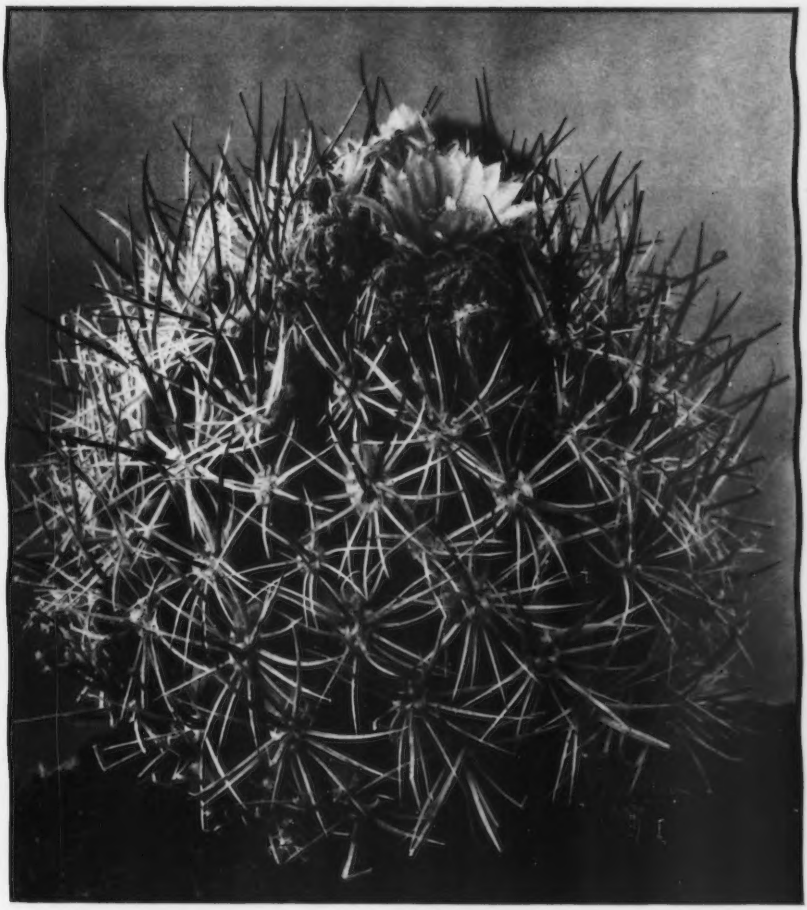

FIG. 39

Utahia Sileri in flower May 14, 1940. The stem of this specimen was 9 cm. tall, 11 cm. in diameter. Plant collected one-half mile east of Pipe Springs, Arizona, altitude 4,900 feet, Peebles and Parker 14,692, May 7, 1940. The largest specimen collected was 15 cm. tall, 12 cm. in diameter. Photo by R. H. Peebles.

Notes on Utahia Sileri

By GEORGE LINDSAY
Lemon Crest Ranch, Lakeside, California

Utahia Sileri is one of the lesser known, but more interesting, of our native cactus species. "Lost" for many years, it was rediscovered in 1931 by John Wright, and later collected by two commercial collectors. While it thus became known in some collections, little information has been available concerning the distribution, habitat, and other aspects of the plant.

Interestingly enough, the true location and distribution has been confused ever since the discovery of the plant by John Siler. The type locality was listed as "Cottonwood Springs and Pipe Springs, southern Utah."[1] In the two JOURNAL articles[2] reporting the rediscovery and

1. Engelmann in Coulter, Contr. U. S. Nat. Herb. 3:376. 1896
2. Journal III, 5, pg. 88, 89; IV, 1, 213-214

flowering of the species, the collection locality is given as the same place, again in "southern Utah." The genus name itself, bestowed by Britton and Rose in 1922, when they segregated this species from the genus *Echinocactus,* was given in honor of the state from which the plant supposedly came. The remarkable fact is that Pipe Springs actually is in northern Arizona, and it seems doubtful if the plant has ever been collected in Utah!

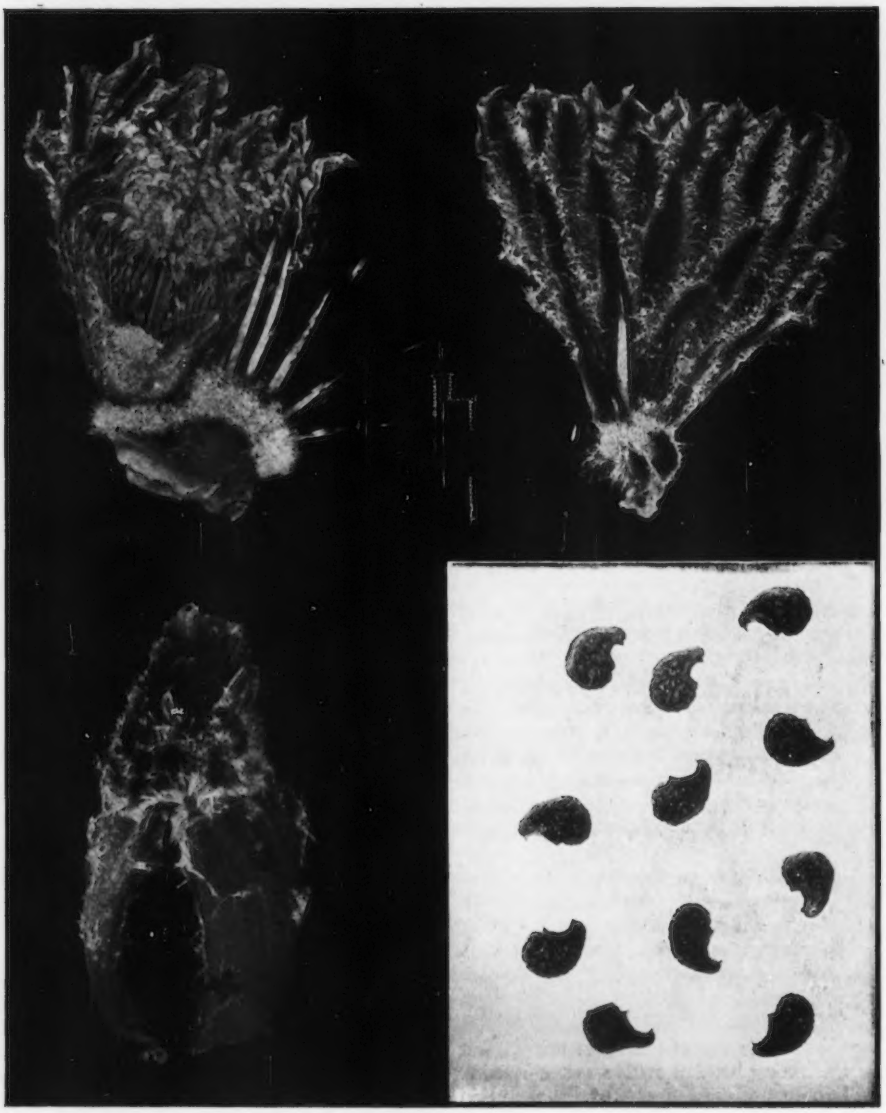

FIG. 40

Utahia Sileri. ABOVE LEFT: pressed flower from inside, showing flower parts, as well as attachment to areole situated immediately above young spiniferous areole: ABOVE RIGHT: pressed flower from outside, showing characteristic long ciliate or "feathery" margins of outer perianth segments. BELOW LEFT: mature fruit bursting vertically. BELOW RIGHT: seeds showing peculiar cerebroid convolutions of tubercles. Mr. Peebles notes that these convolutions are probably an optical illusion caused by the reflection of light from the tubercles, as the seed appears very much different to the eye under moderate magnification. Photos: R. H. PEEBLES

While with the Desert Botanical Garden of Arizona I began to "check up" on some of the little known cacti of that region. One day while discussing some of the plants with Mr. Fred Gibson, Director of the Boyce Thompson Arboretum, he mentioned that Mr. Leonard Heaton, custodian of Pipe Springs National Monument, had sent him specimens of *Utahia*. I contacted Mr. Heaton by letter and he very kindly told me the plants were to be found about the monument, and offered to show me where he had seen them. As a result, a friend and I drove up to Pipe Springs, where we spent two or three days scouting.

Mr. Heaton showed us where to find the plants. They were found growing only in the restricted outcroppings of gypsum soil. The specimens would be fairly abundant in a small area where the gypsum outcropped, but we failed to find any in other types of soil. We found our specimens all within a mile or two of the National Monument, some to the east towards Fredonia and others north, on the road to Moccasin.

After returning to Phoenix I attempted to find out where others had collected the plant. While I was unable to contact either Mr. Hinton Siler, son of the discoverer of the plant, or Mr. Kapp, who had collected it before, Mr. Heaton stated that Mr. Siler had told him that the original material had come from Arizona. Mr. F. Radley told me that he had seen the plant all the way from Pipe Springs eastward to Shiprock, near Fredonia. He said that he also found plants a short way east of Fredonia, but only in the characteristic gypsum outcroppings at the base of Vermillion Cliffs. Thus it would seem that the known distribution for *Utahia* is confined to a narrow belt stretching about fifteen miles parallel to and south of the Utah border. (See map.)

After returning to Phoenix I sent specimens to Mr. Robert H. Peebles, who is well known to JOURNAL readers through his extensive and thorough work with the Arizona Flora. Mr. Peebles prepared herbarium sheets from the plants sent, and from this material and that at the Botanical Garden he compiled the most complete description of *Utahia Sileri* to date. Then in May of 1940, Peebles collected additional material at Pipe Springs, and from this material got the complete flower description. I wish to include this last and complete description, which Peebles has kindly sent to me, as I feel that it will be of special interest to those working on the ECHINOCACTANAE.

Utahia Sileri (Engelmann) Britton and Rose, Cactaceae 3:215. 1922. *Echinocactus Sileri* Engelmann in Coulter, Cont. U. S. Nat. Herb. 3:376. 1896.

Plant simple, globular to oblong, to 15 cm. high and 12 cm. in diameter; ribs completely obsolete; tubercles strictly distinct, crowded in 8 to 16 spiral rows, pale green, rhombic-angled toward base, tapered and more or less terete above middle, 1 cm. long and about as broad at base: areoles white-woolly; radial spines 11 to 13, ashy-white, 13 to 18 mm. long; central spines 3 or 4, terete, at first nearly black, soon becoming whitened toward base, and finally completely ashy-white, the fibers of all spines separating in age or towards base of plant to give fuzzed aspect; flowers terminal, borne at woolly areoles above and adjacent to the spiniferous areole, 28 mm. long, about 25 mm. in diameter when open, the outer perianth segments lanceolate, fringed on margins, yellowish with maroon midstripe, the inner

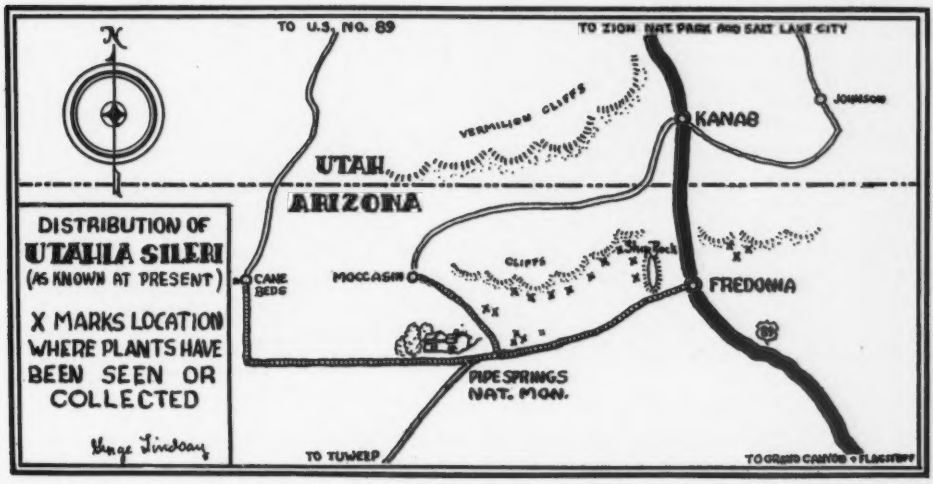

FIG. 41

segments oblanceolate, entire-margined, yellowish; style and stigma yellowish; filaments yellowish, pink toward base; anthers yellow; fruit green, 9 or 10 mm. high, 9 or 10 mm. in diameter, rounded at base, truncate and flat at apex, dehiscent by longitudinal fissure; seeds obovoid, 2.5 mm. wide, 4 mm. long, dark reddish-brown and shining under microscope but appearing black and dull to the unaided eye, the surface covered with bead-like tubercles.

The flower from which this description was drawn blossomed on May 14, 1940, the fruit description being made from fruit maturing June 13. It is interesting to note that in the original description of the species[3] ribs are given as 13, prominent, although the key characterization is "tubercles distinct (as in Cactus)". In the plants I collected there was no evidence of ribs, the tubercles in all plants being distinct, and arranged in spirals but not joined. Schumann[4] describes ribs as being 13 to 16, "almost divided into nearly rhomboid tubercles 1.5 cm. high." Britton and Rose merely follow the original Engelmann description as to ribs, without doubt due to the fact that the only material available to them was the type specimen preserved in the herbarium of the Missouri Botanical Garden. Benson notes[5] that "the tubercles of older stems show some tendency to be coalescent and to form ribs," but Peebles in a letter under date of January 14, 1941, states "my careful examination of sectioned *Utahia* plants showed that the tubercles are crowded toward the base of the plant, but (are) not at all confluent, that is without evidence of rib."

Another interesting and unique, though seldom mentioned characteristic of this species is the peculiar fraying of the fibers of the older basal spines. As has been noted, the black tips bleach to an ashy white, and at the same time the fibers composing the spine separate at the tip and fray out, giving the whole plant a fuzzy, interesting appearance, and once one has seen a specimen, others of the species are instantly recognizable.

Peebles has made some fine photographic studies of this species, which are published herewith. I wish to express my appreciation to him for his generosity in lending me his notes, sending both living and herbarium material, as well as in preparing the fine photograph and plate of details for this publication.

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3. Engelmann in Coulter, Cont. U. S. Nat. Herb. 3:376. 1896

4. Schumann, Karl, Gesamtbeschreibung der Kakteen, pg. 445. 1902

5. Benson, Lyman, "The Cacti of Arizona," University of Arizona Biological Science Bulletin No. 5, pg. 114. 1940.

REMOVING SMALL CACTUS SPINES

Eight or nine years ago I took up the study and growing of cactus as a hobby and in a few years possessed a small garden containing about one hundred fifty different species.

This hobby has given me some desirable outdoor exercise and considerable pleasure. I must admit, however, that due to careless handling, the pleasure has been frequently tempered by annoyance caused by acquiring a few spines and a goodly number of glochids in my hands. The larger spines and most of the glochids usually can be removed by pulling them out with the fingers. Frequently, however, some of the troublesome fine spicules break off near the surface of the skin and can not be removed in this manner. Dr. Forrest Shreve in his book "Cactus and Its Home" suggests that these can be removed by scraping with a knife blade. This simple procedure usually is effective, but occasionally a glochid breaks off so near the surface that it is not easily removed by scraping, apparently because the blade slips over the short stump.

About five years ago, after a little experimenting, I discovered that they could be readily shaved off. Now if I find that one of these small trouble makers is not removed by gentle scraping I apply a little soap lather and with a safety razor give two or three strokes up and down and sometimes one or two horizontally over the spot. This always gets them and the trouble is over.

It seemed desirable to know just what happens when either of these methods of removal are used. This was determined by microscopical examination of glochids of *Opuntia phaeacantha* and *O. basilaris*. Free glochids were first examined with a one hundred power magnification and the size, form, taper, and point carefully noted. The back of the hand was then sharply brushed against the opuntia pad hard enough to break off some of the glochids and cause the others to penetrate normally. Part of these were scraped off with a knife and part of them shaved off and then all were examined as before. In each case some were seen to have the point still sharp, proving they had been pulled out while others had lost the extreme end of the tip, apparently not over one-hundredth of an inch long; evidently this had been left in the skin but could not be seen, even with the aid of a ten power hand lens. Certain it is that if the point does remain after either treatment, its presence can not be detected at the time or afterwards by rubbing or by any other test; no soreness develops or any other after effect.

My physician friend assures me that if anything as small as a glochid point is left in the outer or true skin it will be, in a short time, brought automatically to the surface by the skin's normal outward growth, where it wears off so slowly as to be unnoticeable.

This method has been used on myself and a few friends very many times during the past five years and never has failed to give complete satisfaction. It should be understood, however, that it is not recommended for larger spines that may have passed through the skin and into the flesh. Probably glochids never penetrate that deep; my experiences show that before penetrating far, they always bend over or break off.

F. G. HAWLEY, Miami, Arizona.

LECTURE ON FLOWERING CACTI

An illustrated lecture on flowering cacti followed by an open discussion of cultural problems will be given by President Marshall on June 30th, at Oklahoma City, and July 1st, at Kansas City. See local papers for hour and place.

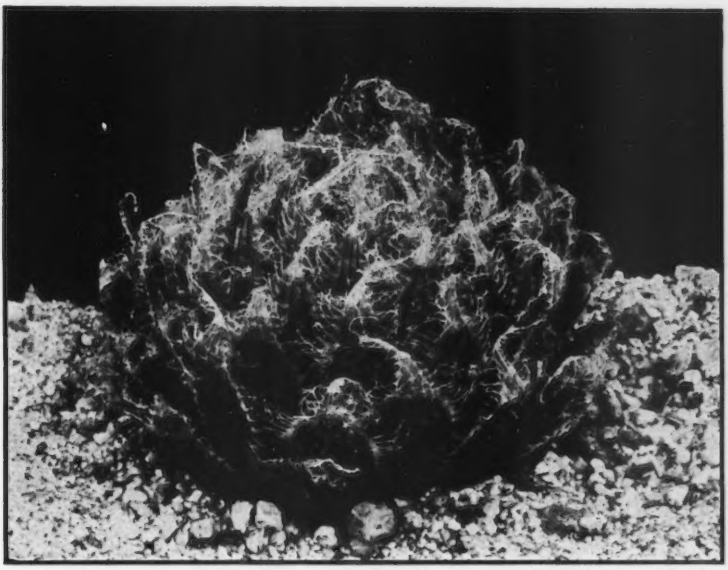

FIG. 42
Haworthia Bolusii Bak. var. *semiviva* Poelln., nat. size.

Notes on Haworthias

By J. R. BROWN

Haworthia Bolusii, Bak. in Journ. Linn. Soc. XVIII (1880) 215; Berger in Pflanzenr. IV. 38 (1908) 114; J. R. Brown in Desert Plant Life VII (1935) 119, photo; Poelln. in Repert. Sp. Nov. XLIV (1938) 223.

Plant 6-8 cm. in diam., with numerous leaves in a crowded rosette. Leaves more or less erect, incurved towards the tip, oblong-lanceolate and long acuminate, to 5.5 cm. long including the 10-16 mm. long, slender terminal bristle, 10-12 mm. wide, pale green, somewhat flat on the face, slightly rounded on the back, and keeled or sometimes doubly keeled in the upper part, with 5-7 lengthwise lines on the upper pellucid part, the margins and the keels ciliated with long slender white teeth, 4-5 (to 8 mm.) mm. long.

Peduncles, including the raceme, 20-30 cm. and more tall, simple; pedicels 2-3 mm. long; bracts deltoid, about 7 mm. long with a greenish-brown keel; perianth 14-16 mm. long, the obclavate tube white, greenish-brown lined, the white, obtuse, reflexed segments with a pinkish tinge, 5-6 mm. long.

Locality: Type locality, Graaff Reinet. Also recorded from Laingsburg.

Introduced to England by Bowie in 1823.

Named in honor of Dr. Harry Bolus, one of the greatest of So. African botanists.

Haworthia Bolusii, Bak. var. **aranea,** Berger In Pflanzenr. IV. 38 (1908) 114. Fig. 39-A-E; Poelln. in Repert. Sp. Nov. XLIV (1938) 223.

Rosette of leaves 5-6 cm. in diam. Leaves narrower and greener than in the type, to 5 cm. long including the terminal bristle, 5-7 mm. wide, obscurely lined, sometimes doubly or trebly keeled towards the tip, the margins and keels fimbriate with delicate white teeth.

Locality: Type locality unknown. Introduced to Kew by Bowie about the year 1823. Recorded from Graaff Reinet; Jansenville; Somerset East.

The finely fimbriated leaves of this plant give it a beautiful, lacy appearance.

Haworthia Bolusii, Bak. var. **semiviva,** Poelln. in Repert. Sp. Nov. XLV (1938) 135.

Differing from the type in its longer and wider leaves and by the withering of the upper

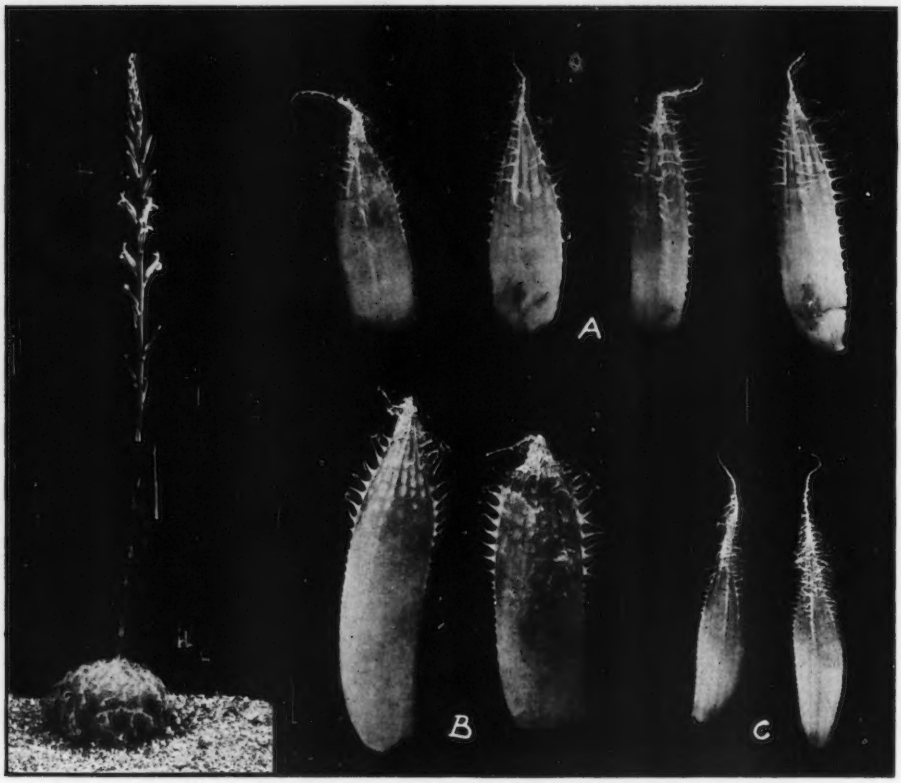

FIG. 43

part of the leaf during the resting stage.

Locality: Type locality, Beaufort West.

An interesting form owing to the upper part of the leaves withering and folding over to form a close mat on the top of the plant during the dormant period. This gives the plant a half-dead or a half-alive appearance, hence the varietal name. This peculiarity may never be observed however, in cultivation under glass, as, under these conditions the top of the plant tends to open up and lose this distinctive, closely matted appearance.

It is at once distinct, however, by the somewhat larger rosette of leaves, the longer leaves (5.5-7 cm. long including the end bristle) and especially by the wider leaves (12-16 mm.) The color and the lines are about the same as in the type. The long ciliate teeth on the margins are extremely curled and entangled and may attain a length of 12 mm., the bases of the teeth are wider than in the type. The long hair-like terminal bristle is also long ciliated, so that the appearance of several terminal ciliae is given.

Haworthia Bolusii and its vars. are the most slenderly toothed plants of the sect. *Setato-Araneae* (Berger) Poelln., the teeth taking the form of long, very fine, white hairs which are intricately tangled. In the dormant stage, these hair-like teeth form a protective covering to the closely compact rosette of leaves, this is especcially noticeable in *H. Bolusii* var. *semiviva.* In cultivation they are beautiful little plants and appear to be simple, never forming offsets.

The photos illustrating these plants, show: A plant of *Haworthia Bolusii* Bak. var. *semiviva* Poelln., nat. size, taken at the beginning of the growing period. A plant of *Haworthia Bolusii* Bak., greatly reduced, showing its habit in flower. A, four leaves of *H. Bolusii,* nat. size. B, two leaves of *H. Bolusii* var. *semiviva,* nat. size. C, two leaves of *H. Bolusii* var. *aranea,* nat. size. The back of the leaves only is shown.

CEROPEGIA

Ceropegia Lugardae, N. E. Br., Ceropegia kwebensis, N. E. Br., C. floribunda, N. E. Br.

By MAJOR E. J. LUGARD

These admirable reproductions of the original unpublished water-color drawings by my late wife illustrate the three species of *Ceropegia* discovered by us in 1898, when we crossed the Kalahari Desert to Ngamiland, the country around Lake Ngami in the Bechuanaland Protectorate, South-Central Africa. In those days that country was practically a *terra incognita* to the botanist, and we were asked by the authorities at the Royal Botanic Gardens, Kew, to make a collection of the flora. The country does not carry either a numerous or a very beautiful flora, like that of the Cape, but, with the specimens collected by my brother (Lord Lugard) and myself in the previous year, we succeeded in making a collection of 374 species, of which no less than 92 species proved to be new. The collection was determined by the distinguished botanist, Dr. N. E. Brown (1849-1934); his work was published in Kew Bulletin No. 3 of 1909, pages 81-146, which was "his most important separate paper on the African flora, most of his determinations having stood the test of time and revision" (see Obituary Notice in Kew Bulletin, 1935, page 58). My wife made a series of water-color drawings of the flora—a total of 245—which "greatly facilitated the work of determining the collection"; these were purchased by the Bentham Trustees and presented to Kew (see Kew Bulletin, 1925, page 348). The drawings here reproduced are part of this series.

I will not weary my readers with a description of Ngamiland, of which I gave a full account in the *Cactus and Succulent Journal* for May, 1938, when the Society honored my wife by publishing her drawing of *Monadenium Lugardae,* N. E. Br. We only discovered these three species of *Ceropegia,* and these were rare and all three proved to be new. Although of no great beauty, they are botanically among the most interesting of our discoveries, and I am greatly honored by the Society's publishing these drawings. The three species are fully described by Dr. N. E. Brown in the *Flora of Tropical Africa,* vol. iv, 1, pages 455, 456, and 460.

NOTE: It is a signal privilege to be enabled through the courtesy of Major E. J. Lugard, to present to readers of the *Journal* reproductions of three water color drawings of *Ceropegias* from Ngamiland, executed by his late wife, Mrs. Nell Lugard. Mrs. Lugard was a miniature painter of note, whose work was frequently exhibited at the Royal Academy in London. When she accompanied her husband on a botanical expedition to British Bechuanaland, she turned her talents to drawing many of the plants collected in a series of little works of art, which reveal all the beauty of detail for which her miniatures had been distinguished. Although only a part of the three drawings are in color, the sketches are so faithful that one can readily visualize the lovely color effect of the plants as a whole.

MRS. E. J. LUGARD

It is a great pity that more of the *Ceropegias* from Tropical Africa have not been introduced into cultivation, as in many cases the shapes of their flowers are as beautiful as they are strange. Many of the species, including the three here figured, are twining vine-like perennials with very delicate rambling stems. The leaves are varied in form and substance, somewhat fleshy in *C. floribunda,* thin and charmingly wavy at the margins in *C. Lugardae.* And strangest of all are the flowers, with long and graceful corollas, tubular at the lower part, then opening into a cage-like apex, the corolla lobes first spreading apart more or less and meeting again at their

ABOVE: *Ceropegia floribunda*, N. E. Br. in Fl. Trop. Afr. iv., 1, p. 460. Kwebe Hills, 3,000 ft., very rare, Mrs. Lugard, 161. A creeper; corolla green tinted with purplish at the base. OPPOSITE PAGE—TOP: *Ceropegia kwebensis*, N. E. Br. in Fl. Trop. Afr. iv., 1, p. 456. Kwebe Hills, 3,400 ft., apparently rare, Mrs. Lugard, 116. Creeping on rocks; corolla green outside, with purplish hairs on the lobes. OPPOSITE PAGE—BOTTOM: *Ceropegia Lugardae*, N. E. Br. in Fl. Trop. Afr. iv., 1, p. 455. Kwebe Hills, 3,000 ft., Mrs. Lugard, 262. Flowers green, spotted with purple-brown outside.

Tube of flower cut open, showing all the parts of flower above.
Looking down on centre of flower, with the petals(?) cut off. Showing the anthers lying under their cases
Vertical section, showing one petal(?) then anther cases, & pistil.

Nell Lugard
Kwebe Hills
Jan. 19. 1898.

pegia Lugardæ.
new sp.

MAJOR E. J. LUGARD

tips. Within the corolla, the corona forms a tiny object of great perfection, especially well shown in Mrs. Lugard's drawing of *C. Lugardae*. Besides their varying color schemes and the modified details of the coronas, the flowers of the three species are separated by the shapes of the corolla lobes. They are longest in *C. Lugardae*, and spirally twisted like little living corkscrews. In *C. kwebensis*, the lobes are only slightly shorter, quite straight and more noticeably hairy, very light green in color with the hairs purple. In *C. floribunda* the lobes are shorter, forming an almost globose little cage. The name *floribunda* means freely-flowering, and is certainly appropriate to the many-flowered clusters, which appear at every node. The name of *C. kwebensis*, of course, refers to the Kwebe Hills, where all three species were found, while the name of *C. Lugardae* commemorates the distinguished lady, to whom the discovery of all three species, as well as these charming records in color, was due.

The *Journal* is much indebted to Major Lugard for his kindness in contributing the drawings as well as the preceding short article on the circumstances under which they were collected.

ALAIN WHITE - BOYD L. SLOANE.

SUMMARY OF VITAMIN B_1

After a study of literature concerning the benefits of using the various vitamin products one would wonder how our grandmothers were able to raise their families to normal adulthood in such an unenlightened day. Vitamin B_1, as well as all other vitamins, are new only in their concentrated form. Years ago horticulturists noted the advantages of using brewer's yeast in watering their plants. The improvement was much more notable where their compost consisted of great portions of humus in the form of peat. In European orchid houses this method was used, it being a secret of the trade handed down from father to son. In some instances pasteurization was practiced to prevent fungi and other detrimental results from its use.

The rapid tempo of the twentieth century has created the habit of expecting not only something in a bottle for every ache and pain, but the same for every plant ailment. We believe in taking advantage of every modern facility that will enable us to produce better quality material, or help us control the various disorders of our plants. While there may be no need of caution in accepting and using various products, they are often useless unless their use is actually based on the need of the plant.

From our experiments and tests on over 100 different items, comprising over ten thousand plants in various phases and conditions, we noted results on two plants, namely Cereus hybrids and *Echeveria multicaulis*, where an extraordinary root system was formed. Our conclusions are that where soil is sufficiently supplied with necessary elements there is no great advantage in the use of vitamins in concentrated forms; this explains the enthusiasm with which some gardeners recommend a product while others, equally as conscientious, state no advantage has been noted.

E. C. HUMMEL.

GREENHOUSE VS. WINDOWS

For three years I have had the pleasure of housing my plants in a little 9x12 feet greenhouse, hot water heated, with the pipes beneath the benches. What joy it is over the former way of having every window crowded with plants, with the exception of the bedrooms and bathroom. There is much less work and many more blossoms have been enjoyed since.

Just about two years ago another cactus friend presented me with a seed-pot of an Echinopsis hybrid. I seeded it in a flat 8-inch pot. In a short time they came up like "hair on a dog." By September the pot was so crowded that they had to be transplanted. My daughter and I set out one morning to transplant these tiny plants. We made wooden flats and started, and by noon we still had some to plant. When we finished with the job they were counted and to our surprise we had transplanted 525 tiny plants. The next summer (1940) I had to transplant them again, and to my surprise I had 550 plants. There still was some seed that was not sprouted but came up after the larger seedlings were transplanted.

This fall when I prepared the greenhouse for the winter I found that I had more plants than the greenhouse provided place for, so several hundred of these seedlings are being housed in the attic this winter and are doing fine. The largest seedlings of this lot are now over 2½ inches in diameter. Other seedlings we raised have bloomed the second year—the Rebutias and Mam. camptotricha. The Lithops seed that we purchased from Mr. Kelly two years ago came up fine and the plants have caused much excitement for those visitors who have never seen such plants before. We have many visitors throughout the year to see our collection, and all are most welcome.

I hope that this letter will interest some of those cactus lovers that have to house their collection in windows and will become interested and build a little greenhouse and see for themselves what a pleasure and how much less work it is to have a little greenhouse.

LAURA E. KANTCHEFF, Wisconsin.

FIG. 46
Conophytum Vanzijlii L. Bol. and *Lapidaria Margaretae* Schw. are good examples of mimicry.
Photo by H. Herre, So. Afr.

Living Pebbles and Stones

From *Missouri Botanical Garden Bulletin*

By LADISLAUS CUTAK

In charge of Succulents, Missouri Botanical Gardens

If you are numbered among those who seek the odd and fantastic in plant life, you will be interested in the stone-like plants from the warm, dry regions of South Africa. Curious diminutive mimics they are, with lovely blossoms of radiant shades, and yet easily grown under the most ordinary conditions. If ever a succulent merited a trial in the home, the "stone and pebble" plants certainly do.

Originally "stone plants" were included in a single genus, Mesembryanthemum, on accouut of the similarity of their flowers. In recent years, however, various students of this plant group, among whom are the late Dr. N. E. Brown of Kew, Louisa Bolus of South Africa, and Dinter and Schwantes of Germany, have divided the genus into over one hundred genera, many monotypic. When referring to these plants, the term "mesembryanthema" or "mesembs" is generally used. Jacob Breyne (or Breynius) was apparently the first to use the descriptive name of Mesembrianthemum (note the spelling) in his "Catalogue of Rare Plants," published in 1689. The name is derived from two Greek words meaning "noon-day flower" because the blooms of the early-known species opened during the mid-day period. Linnaeus, the father of modern botany, changed the "i" into "y," and most modern taxonomists follow his spelling. The genus, as early as 1648, contained about fifteen species. Since that time, many other kinds have been found that open their flowers at various periods, some even being nocturnal. By 1862 about 293 species had been described. The newer genera all bear descriptive names, Argyroderma, Conophytum, Glottiphyllum, Lithops, Pleiospilos, Titanopsis, meaning "silver-skins," "cone plants," "tongue plants," "stone faces," "spotted plants," and "limestone mimics," respectively. This group of "mesembs" is mostly stemless, and looks very different from the shrubby and trailing types that are grown extensively in California gardens for their very gorgeous floral carpets of rose, scarlet, orange, golden yellow, shell pink, and glowing purple. However, the former, with their uncanny resemblance to the stones around which they grow, are far more fascinating and are much more sought after by connoisseurs of bizarre things.

A sunny location is a primary requisite if these

FIG. 47
Gibbaeum Comptonii L. Bol. resemble smooth round stones which split and produce large colorful flowers. Photo: H. Herre, So. Afr.

same type of soil as listed previously can be used, but the top layer upon which the seeds are broadcast should be sifted through a fine 18-mesh screen such as is used for window and door screens. Several pieces of broken pot are placed in the bottom of the pot for drainage, coarse compost added and tamped down firmly, then a sifting of finely screened soil. Seed is broadcast over the top and covered very lightly with the same fine mixture tamped evenly once more. The pot is then placed in a pan of water to absorb the needed moisture. Cover seed-pot with a square piece of glass, place in a warm but shaded position, and never allow the soil to become dry, even after germination. Avoid having the soil too wet, however.

After germination remove the glass cover, and shield the seedlings with newspaper from the direct sunlight. Transplanting need not be performed for a long time, unless the small plants are very crowded and there is danger of damping-off disease. Too early transplanting is not recommended, because the seedlings have but a very fine short root and there is great danger of injuring this organ in the shifting process.

Most "mesembs," especially of the mimic type, will germinate within a week or two from time of sowing seed. This includes such genera as Argyroderma, Cheiridopsis, Conophytum, Dactylopsis, Dinteranthus, Fenestraria, Gibbaeum, Glottiphyllum, Juttadinteria, Lithops, Rimaria, Titanopsis, and many others. A recent experiment, one of many conducted to date, may be of interest to culturists and is appended here. The seed used was two to three years old.

"Mesembs" of the fig-marigold type (so called because the fruits look like figs and the flowers like marigolds) begin to bloom at an early age, but most of the "mimics" will require from three to five years from time of sowing. *Aridaria resurgens* has germinated in fourteen days, and was in bloom exactly five and one-half months later. The Faucarias, or tiger jaws, usually germinate in fourteen to seventeen days and bloom in the eighteenth month. Lithops require four and five years to reach the flowering stage, although some species may flower as early as three years. Conophytums have produced blossoms in three and four years, as have Imitarias, Fenestrarias, Lapidarias, Lithops, Rimarias, Titanopsis, etc.

Insects and bacterial diseases may play havoc with a "living stone" collection unless a careful watch is maintained. Absolute care must be exercised when handling these succulent sphaeroids, for an ever so slight bruise or damage will be an entry point for bacteria. Often the whole plant will suddenly topple over in a heap of watery tissue, to the utter sorrow of a collector. Mealy bugs, red spider, and thrips are common insects that readily attack these curious "mesembs," but an occasional spraying will keep such pests in check. Mealy bugs around the roots are hardest to detect, for they cannot be seen until the damage has been done. Whenever any "mesemb" appears sickly and shrivelled and no cause for this condition is apparent, examine the root system for these root lice. As a remedy, wash roots in water, dip in alcohol for a minute or two, and repot in new soil. Mealy bugs often congregate beneath the old withered leaves, remaining about the base of Lithops, Conophytums, etc., and in the orifice or slit that extends

plants are to thrive. Growing among the rocks or embedded in sand in their natural habitats, where the sun often beats down upon them mercilessly and where rainfall is limited, they have adapted themselves to most severe conditions. They can, therefore, be grown in any home upon the window-sill. Fresh air is almost as important as sunlight, but despite the lack of it during the cold wintry days the plants will survive. Even hot-air heat and house gas do not seem to affect these plants, but an atmosphere surchanged with sulphurous fumes is detrimental.

On the whole, stone and pebble plants make but modest demands upon the soil from which they draw their nourishment. Although they will live in almost any kind of soil, those heavily manured should be avoided. The stone plants at the Garden are grown in a soil mixture composed of equal parts of well-rotted leaf-mold, sand, and compost, screened through a quarter-inch mesh. Gravel and broken fragments of limestone are placed around the plants, this as a precaution against rot diseases which often set in when the succulent bodies come in contact with the wet soil.

As to watering, the rule for most succulents, "rather less than too much," should be observed. The watering of the more delicate species of Conophytum, Fenestraria, etc., is really an art that cannot be explained by words, but is acquired only by experience. Never water on cool cloudy days or when the sun's rays are directly on the plants. The best method of watering "mesembs" is from below. A long narrow tray

FIG. 48
Conophytum truncatellum. From "Flower Grower." Courtesy Sarah V. Coombs.

(preferably one to two inches in depth) that fits into the window will be found very convenient for holding pots of "mesembs." When moisture is necessary, fill this receptacle with water, allow a slight wetness to penetrate to the top of the soil, then immediately pour off the excess water from the tray, and the watering problem is solved. Repeat this operation when necessary. For indoor culture, never water overhead except under favorable conditions, and then only when the plants are growing vigorously. A syringe is beneficial for most plants, but succulents do not tolerate water on their bodies for lengthy periods, especially during the cool, cloudy wintry days of our temperate climates. More stone plants will be lost during our mid-western dormant season than at any other time of the year, if watering is not controlled. All the "succulent mimics" are so constructed that they are able to retain and hoard up moisture for a long time. Evaporation is much more limited in these kinds than in non-xerophytic plants, so that watering once or twice a month should suffice for those grown in the home.

FIG. 49
The rare *Conophytum Ursprungianum* Tisch. has its own unique camouflage. Photo by H. Herre, So. Afr.

When planting "mesembs," do not have the pots too large or too deep. The ordinary four-inch porous flower pot is excellent, but better still is a six-inch seed pan (that having a depth of 3½ inches). In such a container several plants can be grown. Drainage is of the greatest importance, and can be assured by placing pot shreds and gravel in the bottom of the container. A very successful way of accumulating a notable collection of stone plants is to grow them from seed.

Fresh seed is preferable to old, but the writer has had good results from seed two and three years old. It is advisable not to sow all the seed at one time. In the greenhouse the time of sowing is not restricted to any particular season, but in the average home spring is the ideal period. Regular seed-pans or the handy four-inch porous pots are generally used for this purpose. The

directly across the body. Thrips disfigure these plants with their characteristic rasp-like markings. An occasional spray with nicotine or one of the commercial insecticides will keep stone-like "mesembs" insect-free. In greenhouse culture, sow-bugs and millipeds will frequently attack the roots and juicy stems, and they are also responsible for the dissemination of bacterial diseases. Rid the premises of these pects.

There is a long list of South African "mimic" plants from which to choose. Foremost among these are the Lithops, or stone-faces, with their reddish, whitish, brown, or rust-colored tops, often mottled, and closely resembling the soil, stones, and pebbles among which they grow. At the present time about fifty species are recognized by botanists. Over a century ago, Burchell picked up one of the first Lithops, thinking it was a pebble, when lo! to his astonishment, it turned out to be a living plant. One of the easiest and most attractive species to grow and one that can stand quite a bit of water during the summer is *Lithops Lesliei* from Transvaal. It possesses a flattened top that is deep red and brown in color. Some other interesting species are *Lithops alpina,* an early-blooming form, *L. Aucampii, L. bella, L. Comptonii, L. Dinteri, L. Eberlanzii, L. Elisabethae, L. Erniana, L. floris albis, L. Fulleri, L. fulviceps, L. gracilidelineata, L. Julii, L. karasmontana, L. kuibisensis, L. kunjasensis, L. marmorata, L. Meyeri, L. mickbergensis, L. Mundtii, L. optica, L. opalina, L. Peersii, L. pseudotruncatella, L. rugosa, L. Ruschiorum, L. summitatum, L. terricolor, L. turbiniformis, L. umdausensis, L. urikosensis, L. Vallis-Mariae,* and *L. Vanzijlii.*

Next to the Lithops, the Conophytums or "cone plants" are perhaps the most desirable. Usually growing in a cluster of globose to obconic bodies, they are the smallest of all "mesembs," free-flowering when given plenty of sunlight and rest during the early summer months. There are about 130 species, all preferring the hollows and crevices of rocks in South Africa. The first of the Conophytums discovered was *C. truncatum* before 1791, when of course it was known as *Mesembryanthemum truncatum.* Some of the outstanding species are *Conophytum altum, C. Ernianum, C. Maughani, C. minusculum, C. translucens, C. minutiflorum, C. Purpusii, C. odoratum, C. Luisae,* and *C. vanrhynsdorpense.*

The Argyrodermas, answering to the name of "silver-skins," are most peculiar plants, growing among the white quartz rock in their natural habitat. Only two pairs of thickened leaves appear at one time, these firm in texture and covered with a very smooth, white skin. The most notable species is *Argyroderma testiculare* with

FIG. 50
Titanopsis Schwantesii grown from seed by H. Tobusch, Illinois.

silver-gray leaves. It has been in cultivation for over a hundred years. Other worth-while species are *A. Jacobsenianum* and *A. Schlechteri.*

Plants of the genus Gibbaeum are commonly called "gouty plants." Many of these grow among the white quartz rock and bear the closest similarity in color and texture to their background. There are about eleven species, some with small, velvety, chocolate-colored finger-like leaves, others with very curious, spherical, stone-like growths, and still others forming dense mats of green, quaintly shaped leaves. *Gibbaeum pubescens* was already in cultivation as early as 1795. Other Gibbaeums include *G. album, G. angulipes, G. dispar, G. geminum, G. molle, G. pachypodium, G. perviride, G. pilosulum, G. Shandii, G. Bosscheana,* and *G. velutinum.*

The Fenestrarias are notable curiosities, in which the tufted club-like leaves have a window in the tips. Growing in the sand deserts of South West Africa, the plants are almost entirely covered with sand, except for these transparent windows which admit light to the plant, and without which the plants could not possibly live. There are two species, the white-flowered *Fenestraria rhopalophylla,* known as "baby toes," and the golden-flowered *F. aurantiaca.*

The Pleiospilos look so much like fragments of rock that one is often forced to feel the leaves to convince himself that he is touching a plant. All the species bear thick, angular leaves, some resembling water-worn stone and others success-

fully disguising as the shale in their natural surroundings. All Pleiospilos are easy of culture, perhaps the easiest of all the stone-shaped "mesembs," and it might be worth while for the novice to begin with these before attempting Conophytums, Argyrodermas, Fenestrarias, and the like. The most sought-after species are *Pleiospilos Bolusi* and its very near relative, *P. simulans*. The flowers are bright yellow, have a very pleasant odor, and open towards evening for about fourteen days.

The limestone rosettes, or Titanopsis, are well-named. Composed of flat rosettes of rough-surfaced leaves, they so strikingly resemble calcareous matter that they might be taken for beautiful coral rather than a member of the plant kingdom. The encrusted tips of the leaves will assume a brilliant violet color when the plant is grown in the full sun and not watered too much. By all means include the Titanopsis in your collection.

Pages and pages could be written about the very numerous stone-like "mesembs," but only a few of the remaining outstanding ones can be mentioned here. Cheiridopsis is a large genus with considerable variety both in the shape of the leaves and in the body itself. Some of the species were already known as early as 1732. *Cheiridopsis peculiaris* has the most exceptional form; *C. Caroli-Schmidtii* has finger-shaped leaves; and *C. speciosa* has velvety, grayish-green leaves and coral-red flowers with a shimmering copper luster.

Then there are the quaint Rimarias with their globular growths; the very stone-like *Didymaotus lapidiformis* with fleshy angular leaves; the attractive semi-trailing Juttadinterias; the novel *Imitaria Muirii;* the finger-like growths of *Peersia macradenia;* the dwarf, peculiarly warted and toothed Stomatiums; and a host of other very interesting forms.

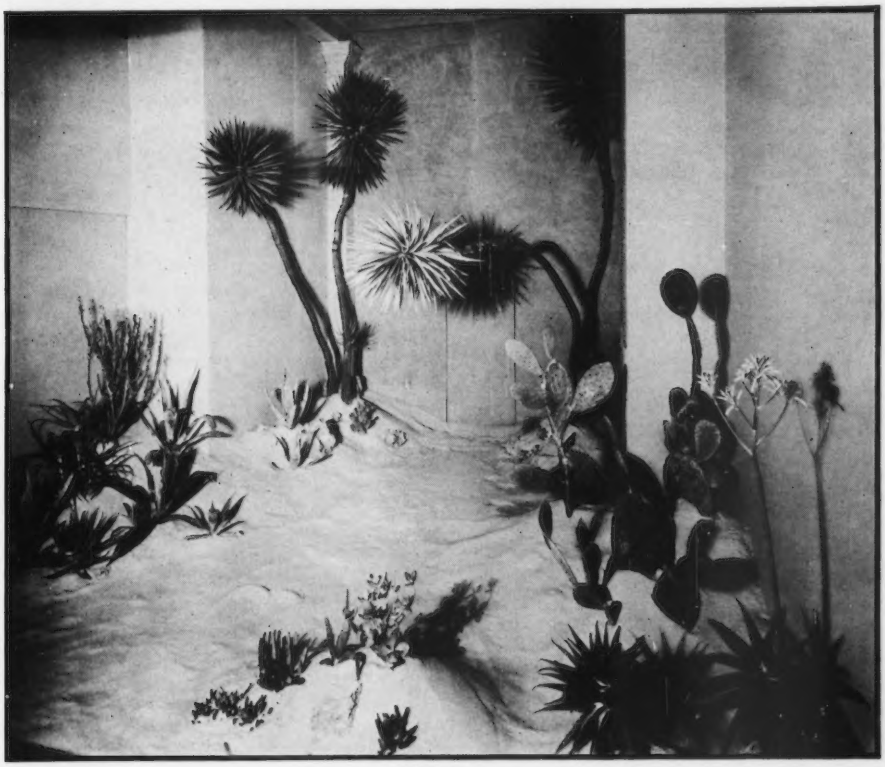

FIG. 51

At the International Flower Show, held at the Grand Central Palace, New York, in March, the Garden Club of America staged an exhibit symbolizing Pan-America. This consisted of a patio in the southern style, decorated with plantings of various character. Two alcoves represented desert plantings, arranged by a committee of which Mrs. John R. Delafield, of New York, was the Chairman. Here were cacti, yuccas, agaves, euphorbias, crassulas and other xerophytes planted against the background of the patio. The exhibit aroused great interest.

FIG. 52
Neogomesia agavioides Castaneda. Nat. size.

A New Cactus

By M. CASTANEDA

From the State of Taumalipas, Mexico, comes this plant new to science despite three hundred years of investigation by botanists and collectors. That it has escaped observation for all of this period is due to its small size and retiring disposition for only when the large, rose-colored flowers are open is it noticeable.

Many characters set it off from known genera which will make it an item of deep interest to collectors and botanists alike, while its mimic form and very attractive flowers will recommend it to all lovers of desert plant life.

NEOGOMESIA genus nova, Castañeda

Planta simplex humilis apice plana, radicibus carnosis fusiformibus. Tubercula rosulata cartilaginae folia *Agavei* simulant. Areolae magnae dense tomentosae in superficiem tuberculorum feruntur. Flores infundibulo-campanulati in partes inferiores tuberculum nascentium feruntur, tubis florum longis nudis, sepala pauca colorata ferunt. Fructus baccatus clavatus ruber.

Plant simple, low, with flat top; rootstocks fusiform, fleshy; tubercles resembling the leaves of an *Agave,* cartilaginous, in rosette formation; areoles on the upper face of the tubercles, large and bearing dense, long wool; flowers funnelform-campanulate, the long tube naked except for a few sepals, these colored and without content in their axils; flower and fruit arising from the lower part of the areoles of nascent tubercles; fruit a clavate, red berry.

This genus is nearest to *Ariocarpus* from which it differs in its long-tubed flower and its clavate, red fruit which is prominently in sight from the first.

In its long tubercles and long-tubed flower it is also reminiscent of the genus *Leuchtenbergera,* which is reported from adjacent districts. Both *Neogomesia* and *Leuchtenbergera* have stems built up by the dried base of the withered tubercles which Hooker noted as "resembling the stems of some cycads." *Neogomesia's* naked tubed flowers, indehiscent fruits and the position of its flowers amply separate it from

Leuchtenbergera. The genus is named in honor of Engineer Marte Gomez, Governor of the State of Taumalipas, Mexico.

Neogomesia agavioides sp. nov. Castañeda

Planta simplex depressa 5-8 cm. lata cinereo-viridis, radice carnosa fusiforme; tubercula 5-10 cartilaginae rugosa 4 cm. longa base circa 6 mm. lata apice acuta vel mucronata recurvata super de basibus ad areolas plana vel leviter convexa do areolis ad apices concava subter convexa vel leviter carinata, tuberculis junioribus erectis finaliter horizontalibus; areolae rotundatae 3-4 mm. diametro cinereo-lanatae in superficies circa 1 cm. deorsum apices tuberculorum ferunter; spinae aut nullae aut 1-3 sublatae adpressae 3-5 mm. longae albae vel alboluteae; flores rosacei diurni 4-5 cm. longi, tubis circa 2 cm. longis nudis; sepala pauca pallido-rosacea; petala exteriora linearia acuta integra circa 4 mm. lata 20 mm. longa, interiora acuminata 25 mm. longa expansa; stamina flava; stylus albus lobis stigmatis quinque albis; fructus clavatus 20-25 mm. longus ruber.

Plant simple, depressed, 5 to 8 cm. broad, grayish-green; rootstock fusiform, fleshy; the crown of the plant resembles a small *Agave* or *Haworthia* because of the cartilaginous, linear tubercles, these 40 mm. long and about 6 mm. wide at the base, semi-circular in cross section, acute or mucronate, imbricate, rugose, at first erect, later ascending, then horizontal, usually with the tips recurved, the under surface convex or slightly keeled, the upper surface flattened or somewhat convex from the base to the areole, but concave from the areole to the tip; areole on the upper surface, about 1 cm. from the tip, large, round and filled with a mass of long, gray wool; spines usually wanting but occasionally 1 to 3, white to horn-colored, subulate, appressed, 3 to 5 mm. long; flowers in November and December, 1 or 2 to a plant, persistent, opening in the morning and lasting but one day, pink, large, borne near the center of the plant at the lower part of areoles of nascent tubercles, 4 to 5 cm. long, funnelform-campanulate, with a long tube (2 cm. or more in length), naked; sepals few, scale-like, colored; outer perianth segments linear, acute, entire, 20 by 4 mm., white with pink center; inner perianth segments linear, acuminate, spreading, 25 mm. long, pink with a nearly white base; filaments and anthers yellow; style white; stigma lobes 5, white; fruit red, clavate, perianth 20 to 25 mm. long, ripening in April; seeds 1 mm. long, black, urceolate, tuberculate; hilum as wide as the seed.

Type locality: gravelly hills near Tula, Tamaulipas.

Distribution: State of Tamaulipas.

Type material has been deposited in the Dudley Herbarium of Stanford University.

This species superficially resembles a small *Ariocarpus trigonus,* but the tubercles are much longer and narrower and the prominent areoles are set back from the apex. There are only 5 to 10 tubercles to each plant and the rosette arrangement of them suggests a small *Agave* or *Haworthia.* The long tubed flower and the prominent red fruit set this plant off sharply from any known species of *Ariocarpus.*

Acknowledgment is made to Dr. Ira Wiggins who prepared the Latin descriptions.

NOTE BY W. T. M.: This remarkable species was discovered by Engineer M. Castañeda while investigating the Cactaceae of Taumalipas for a monograph that he proposes to publish soon. Senor Castañeda has informed us that he has several other species which he considers to be new, and on which we hope to report in later issues of the JOURNAL.

FIG. 53
Photo of plant deposited in Dudley Herbarium.

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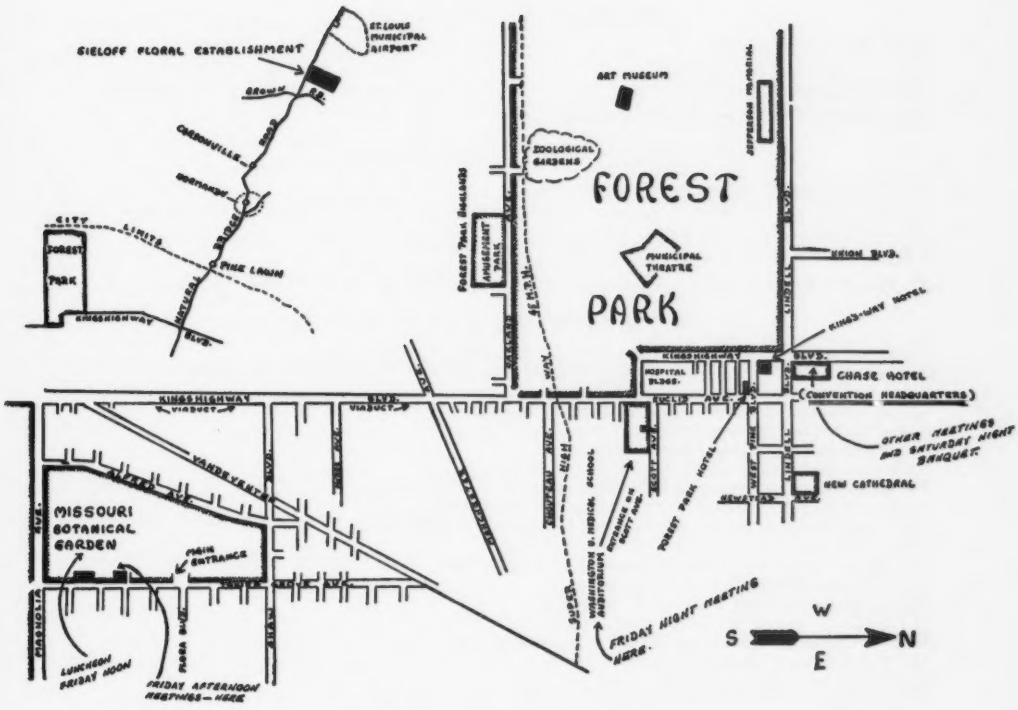

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Cactus and Other Succulent League, Oakland, California
Cactus Study Club, Warren, Ohio
Cactus and Succulent Club, Chicago, Illinois
Cactus and Succulent Society of Japan, Kyoto, Nippon
Cactus and Succulent Society of Milwaukee, Milwaukee, Wisconsin
Cactus and Succulent Society of New Jersey, Bloomfield, New Jersey
Cactus and Succulent Society of Oklahoma, Oklahoma City, Oklahoma
Denver Cactus and Succulent Society, Denver, Colorado
Des Moines Cactus and Succulent Society, Des Moines, Iowa
Desert Garden Club of Tucson, Arizona
Eagle Rock Cactus Club, Eagle Rock, California
El Paso Cactus and Rock Club, El Paso, Texas
Freeport Cactus Club, Freeport, Illinois
Heart of America Cactus Club, Kansas City, Missouri
Kirksville Cactus Club, Kirksville, Missouri
K. I. O. Cactus Club (Kentucky, Indiana and Ohio), Cincinnati, Ohio
Lehigh Valley Cactus and Succulent Society, Allentown, Pennsylvania
Long Beach Cactus and Succulent Society, Long Beach, California
Long Beach Cactus Club, Long Beach, California
Massachusetts Cactus and Succulent Society, Roslindale, Massachusetts
Midwest Cactus and Succulent Society, Lorain, Ohio
Riverside Cactus and Succulent Society, Riverside, California
Roswell Cactus Club, Roswell, New Mexico
San Gabriel Valley Cactus Club, Azusa, California
Southern California Cactus Exchange, Los Angeles, California
Washington Cactus and Succulent Society, Seattle, Washington

OUR HOSTS—THE MISSOURI BOTANICAL GARDEN

DR. GEORGE T. MOORE, *Director* LADISLAUS CUTAK, F.C.S.S., *in charge of succulents*

SCHEDULE OF EVENTS

FRIDAY, JULY 4TH:

Morning—Registration of Delegates, Members and Guests, at the Chase Hotel, our official headquarters.

Noon—Luncheon at the Missouri Botanical Garden.

1:00 P. M.—Short organization meeting, Lecture Room, Missouri Botanical Garden.

1:30 P. M.—"Engelmann and the Missouri Botanical Garden in Relation to Our Knowledge of Cacti." DR. JESSE M. GREENMAN, *Curator of Herbarium.*
"The Naming of Plants by Scientific Method." DR. ROBERT E. WOODSON, JR., *Assistant Curator of Herbarium*

3:00 P. M.—Appointment of Committees, Motions for Consideration, Open Forum.

4:30 P. M.—Conducted tour of the Garden, particularly the desert houses and outdoor rockery test garden.

4:30 P. M.—Meeting of the commercial members, Chase Hotel
C. HAGENBERGER, *Presiding.*

8:00 P. M.—Meeting at Washington University Medical School Auditorium as guests of the St. Louis Horticultural Society. MR. GEORGE H. PRING, *President*
Illustrated talk: "Flowering Cacti and Other Succulents."
HARRY JOHNSON, Johnson's Cactus Gardens, Hynes, California
"Desert Conservation." MRS. STARKWEATHER, *President, Tucson Desert Garden Club.*
"Distribution of Cacti in the Caribbean Region." J.P. CARIBEA, *Guggenheim Fellow at N. Y. Botanical Garden.*

SATURDAY, JULY 5TH:

*10:00 A. M.—Assemble at Chase Hotel and leave for sight-seeing trip in busses.

2:00 P. M.—Meeting to receive reports of Committees. Conclusion of business.
"Grafting Cacti." GILBERT TEGELBERG.

* 4:00 P. M.—Return by Bus to Chase Hotel.

* 6:45 P. M.—Banquet at Chase Hotel.

8:00 P. M.—Meeting open to the public (Chase Club).
"Adventures in Cactus Land." LADISLAUS CUTAK, F.C.S.S., *in charge of succulents, Missouri Botanical Garden.*
"Collecting Cacti in Western Mexico." W. TAYLOR MARSHALL, F.C.S.S., *Honorary Vice-President American Horticultural Society.*
Several other speakers with interesting subjects as time permits, including DR. ELZIDA U. CLOVER, *Department of Botany, University of Michigan.*

SUNDAY, JULY 6TH:

Meetings of special committees and new friendship gatherings.

**Tickets covering these three events may be obtained at headquarters for $3.50*

PHOTOGRAPHIC SALON

CHASE HOTEL, JULY FOURTH AND FIFTH

A collection of 120 studies of cacti and other succulents, and of the desert, open to the general public without charge.

Complete catalogue of photographs and winners of awards may be obtained at headquarters in the Chase Hotel or by mail from Box 101, Pasadena, California, for ten cents.

COMMERCIAL MEN'S SHOW

FLORAL DISPLAY HOUSE, MISSOURI BOTANICAL GARDEN

July fourth and fifth

A showing of material suitable for use by horticultural establishments and for cactus and succulent bowls including bowls properly panted. Open to the general public without cost.

Presented by

CALIFORNIA CACTUS GROWERS ASSOCIATION

CARL HAGENBERGER, *President and Official Delegate to the Convention*
HOWARD E. GATES, *Vice-President* MORRIS SCHICK, *Treasurer*
F. D. CROSBY, *Secretary*

MATERIAL SHOWN WAS GROWN BY:

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